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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte RAPEEPAT RATASUK, JIANGNAN JASON CHEN, and LI-FAN ZHANG

Appeal 2015-007403
Application 12/770,998
Technology Center 2400

Before LARRY J. HUME, ALEX S. YAP, and JENNIFER L. McKEOWN, *Administrative Patent Judges*.

McKEOWN, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134(a) from the Examiner's Final Rejection of claims 1–20. We have jurisdiction under 35 U.S.C. § 6(b).

We reverse and enter a new ground of rejection of claims 10 and 11 pursuant to our authority under 37 C.F.R. § 41.50(b).

STATEMENT OF THE CASE

Appellants' invention is directed "Orthogonal Frequency Division Multiplexing (OFDM) communication systems, and, in particular, to a scheduling of control channels in an OFDM communication system." Spec. 6–8.

Claims 1 and 10 are illustrative and reproduced below:

> 1. A method for scheduling a control channel for a user equipment m an Orthogonal Frequency Division Multiplexing communication system, the method comprising:
>
> determining a channel quality metric associated with the user equipment;
>
> calculating a target control channel element quality metric;
>
> determining a control channel element utilization rate, wherein the control channel element utilization rate corresponds to a past rate of utilization of control channel elements; and
>
> selecting a control channel element aggregation level for the control channel based on the channel quality metric, the target control channel element quality metric, and the control channel element utilization rate.
>
> 10. A method for determining a control channel element utilization rate in an Orthogonal Frequency Division Multiplexing communication system, the method comprising calculating one or more of a number of control channel elements and a percentage of control channel elements allocated to control channels in each of one or more past scheduling periods.

THE REJECTIONS

Claims 2, 6, 13, and 17 are rejected under 35 U.S.C. § 112, second paragraph as being indefinite. Final Act. 2.

Claims 10 and 11 are rejected under 35 U.S.C. § 103(a) as unpatentable over Papasakellariou (US 2010/0135237, pub. June 3, 2010) and Sung (US 2008/0132173, pub. June 5, 2008). Final Act. 3–4.

Claims 1–9 and 12–20 are rejected under 35 U.S.C. § 103(a) as unpatentable over Papasakellariou, Panasonic, *Implicit assignment of PHICH*, 3GPP TSG-RAN WGI Meeting #51, Jelu, Korea, 5-9, November 2007, and Sung. Final Act. 4–10.

ANALYSIS

THE 35 U.S.C. § 112 REJECTION, SECOND PARAGRAPH

Claims 2, 6, 13, and 17

Based on the record before us, we are persuaded the Examiner erred in rejecting claims 2, 6, 13, and 17 under 35 U.S.C. 112(b) as being indefinite.

The Examiner determines that "[c]laims 2, 6, 13 and 17 each recite the phrase a 'control channel adjustment factor', which is vague and imprecise. A person of ordinary skill in the art, at the time of the invention, would not know how to determine the metes and bounds of the claimed invention." Final Act. 2. The Examiner further asserts that the

> Specification merely discloses that if a calculated target SNR is observed to provide unacceptable performance, an adjustment factor then would be used to increase the target CCE SNR in order to improve performance. There is no disclosure whatsoever of what constitutes acceptable performance or how to determine the value of an adjustment factor.

Ans. 11.

Appellants, on the other hand, assert that a skilled artisan would understand, based on the plain meaning and the Specification, that the claimed adjustment factor "is determined based on the PDCCH performance requirements and observed performance, and may be applied to increase target control channel element (CCE) signal-to-noise ratios (SNR)." App. Br. 17. For example, the Specification outlines

> SNR_{PDcCH} offset is an empirically determined adjustment factor that is used to adjust the algorithm based on PDCCH performance requirements and observed performance. For example, due to a variety of transmission factors such as interference, fading, and anything else that may effect a quality of a signal transmitted over the air, the 30 observed system

> performance, such as PDCCH throughput or error rates, resulting from use of a target CCE quality metric, that is, SNR, may provide unacceptable performance absent application of the adjustment factor. In such an instance, the adjustment factor then would be used to increase the target CCE SNR in order to improve performance.

Spec. p. 10, l. 25– p. 11, l. 3. We agree with Appellants. An adjustment factor is a known term in the art and one of ordinary skill in the art would understand the claimed limitation in view of the Specification.

Accordingly, we reverse the Examiner's rejection of claims 2, 6, 13, and 17 as indefinite.

THE OBVIOUSNESS REJECTION BASED ON PAPASAKELLARIOU AND SUNG

Claims 10 and 11

Based on the record before us, we are persuaded the Examiner erred in rejecting claims 10 and 11.

The Examiner finds that Papasakellariou teaches calculating one or more of a number of control channel elements. Final Act. 3. Additionally, the Examiner states that Papasakellariou teaches a utilization rate because it would have been obvious to express Papasakellariou's number of used CCCs to total number of CCCs as a percentage. Final Act. 3. The Examiner admits that "Papasakellariou does not explicitly disclose wherein the control channel element utilization rate is calculated in each of one or more past scheduling periods," but then points to Sung as disclosing "that a channel state calculation comprises calculating an average value over a plurality of past scheduling periods (ABSTRACT, lines 1-15)." Final Act. 4.

Appellants assert Papasakellariou and Sung combined do not disclose "a percentage of control channel elements allocated to control channels in

each of one or more past scheduling periods." Specifically, with respect to Sung, Appellants allege:

> Sung discloses that the average strength of a received feedback signal is measured to measure channel quality, whereby the average strength of the feedback signal is calculated as a weighted moving average within a defined window. There simply is no suggestion or motivation in these documents that teaches or suggests calculating control channel elements allocated to control channels in each of one or more past scheduling periods to determine a control channel element utilization rate, as claimed. For example, disclosing the measuring of a feedback signal over time does not suggest calculating a percentage of control channel elements allocated to control channels in past scheduling periods.

App. Br. 24.

Appellants further assert Papasakellariou similarly fails to teach or suggest "calculating. . . a percentage of control channel elements allocated to control channels in each of one or more past scheduling periods," as recited in claim 10. Reply Br. 4–6. Appellants explain that Papasakellariou's disclosure of using a smaller number of component carriers than total available for a particular user equipment does not suggest the recited calculating a percentage of control channel elements allocated to control channels. Reply Br 5–6.

Based on the record before us, it is unclear the precise mapping the Examiner relies on as teaching the recited calculating a percentage of control channel elements allocated to control channels. The Examiner acknowledges Papasakellariou does not teach this limitation, but the Examiner only points to Sung's calculating *an average*, not a percentage, of feedback signals (which include signal to ratio noise values), not control channel elements. While Sung does perform a calculation based on a past

period, we fail to see how Sung teaches the limitation identified by the Examiner as lacking in Papasakellariou. We also agree with Appellants that Papasakellariou's disclosure that the system may not use all available component carriers for a particular user equipment does not suggest the recited calculating a percentage of control channel elements allocated to control channels. *See* Reply Br 5–6.

Accordingly, we reverse the rejection of claims 10 and 11 as unpatentable over Papasakellariou and Sung.

THE OBVIOUSNESS REJECTION BASED ON PAPASAKELLARIOU, PANASONIC, AND SUNG

Claims 1–9 and 12–20

Based on the record before us, we are persuaded the Examiner erred in rejecting claims 1–9 and 12–20 under § 103.

Specifically, the Examiner relies on the combination of Papasakellariou and Sung as teaching "determining a control channel element utilization rate, wherein the control channel element utilization rate corresponds to a past rate of utilization of control channel elements," as recited in claim 1. *See also* claim 12 (reciting the limitation of "determine a control channel element utilization rate, wherein the control channel element utilization rate corresponds to a past rate of utilization of control channel elements").

Similar to the rejection of claim 10 discussed above, the Examiner identifies Papasakellariou as failing to "disclose wherein the control channel element utilization rate corresponds to a past rate of utilization of control channel elements." Final Act. 5. The Examiner identifies that Sung teaches calculating an average of feedback signals, but, as discussed above with

respect to claim 10, it is unclear how this teaches calculating a past rate of utilization of control channel elements that is identified as lacking in Papasakellariou. Further, as also noted above, merely disclosing that the Papasakellariou's system may not use all available component carriers for a particular user equipment does not suggest the recited calculating a percentage of control channel elements allocated to control channels.

Accordingly, we reverse the rejection of (1) claim 1, (2) claim 12 which recites a similar limitation, and (3) dependent claims 2–9 and 13–20 as unpatentable over Papasakellariou, Panasonic, and Sung.

NEW GROUND OF REJECTION

Within our authority under 37 C.F.R. § 41.50(b), we enter a new ground of rejection for claims 10 and 11 under 35 U.S.C. § 101.

Following the decision in *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 134 S. Ct. 2347 (2014) (citing *Mayo Collaborative Services v. Prometheus Labs.*, Inc., 132 S. Ct. 1289, 1300 (2012)), we analyze claims under the two-part analysis set forth in *Mayo*. First, we consider whether the claim is directed to an abstract idea and, second, if an abstract idea is present in the claim, we determine whether any element, or combination of elements, in the claim is sufficient to ensure that the claim amounts to significantly more than the abstract idea itself. *See Alice*, 134 S. Ct. at 2350.

"Under *Alice* step one, 'claims are considered in their entirety to ascertain whether their character as a whole is directed to excluded subject matter.'" *Smart Systems Innovations, LLC v. Chicago Transit Authority*, 873 F.3d 1364 (Fed. Cir. 2017) (*citing Internet Patents Corp. v. Active Network*, Inc., 790 F.3d 1343, 1346 (Fed. Cir. 2015)). Independent claim 10 is

directed to calculating a utilization rate. As such, the claim, as a whole, is directed to an abstract idea.

Next, we analyze the claims under the second part of the analysis and we find the claims require no more than a generic computer to perform generic computer functions. Claim 10 merely recites calculating two values, a number of control channel elements and a percentage of control channel elements allocated to control channels in past scheduling periods. We find these are mere mathematical calculations that are generic computations to be performed by the computer. The Supreme Court held that "simply appending conventional steps, specified at a high level of generality, to laws of nature, natural phenomena, and abstract ideas cannot make those laws, phenomena, and ideas patentable." *Mayo*, 132 S. Ct. at 1300.

Accordingly, we enter a new ground of rejection for claims 10 and 11 under 35 U.S.C. § 101.

DECISION

We reverse the Examiner's decision rejecting claims 1–20 under 35 U.S.C. §§ 103(a) and 112, second paragraph. We enter a new ground of rejection for claims 10 and 11 under 35 U.S.C. § 101.

This decision contains a new ground of rejection pursuant to 37 C.F.R. § 41.50(b). Section 41.50(b) provides "[a] new ground of rejection pursuant to this paragraph shall not be considered final for judicial review." Section 41.50(b) also provides:

> When the Board enters such a non-final decision, the appellant, within two months from the date of the decision, must exercise one of the following two options with respect to the new ground of rejection to avoid termination of the appeal as to the rejected claims:

> (1) *Reopen prosecution*. Submit an appropriate amendment of the claims so rejected or new Evidence relating to the claims so rejected, or both, and have the matter reconsidered by the examiner, in which event the prosecution will be remanded to the examiner. The new ground of rejection is binding upon the examiner unless an amendment or new Evidence not previously of Record is made which, in the opinion of the examiner, overcomes the new ground of rejection designated in the decision. Should the examiner reject the claims, appellant may again appeal to the Board pursuant to this subpart.
>
> (2) *Request rehearing*. Request that the proceeding be reheard under § 41.52 by the Board upon the same Record. The request for rehearing must address any new ground of rejection and state with particularity the points believed to have been misapprehended or overlooked in entering the new ground of rejection and also state all other grounds upon which rehearing is sought.

Further guidance on responding to a new ground of rejection can be found in the Manual of Patent Examining Procedure § 1214.01.

REVERSED

37 C.F.R. § 41.50(b)